Parasites & Vectors

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Urban lymphatic filariasis in the metropolis of Dar es Salaam, Tanzania

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Abstract

Background: The last decades have seen a considerable increase in urbanization in Sub-Saharan Africa, and it is estimated that over 50% of the population will live in urban areas by 2040. Rapid growth of cities combined with limited economic resources often result in informal settlements and slums with favorable conditions for proliferation of vectors of lymphatic filariasis (LF). In Dar es Salaam, which has grown more than 30 times in population during the past 55 years (4.4 million inhabitants in 2012), previous surveys have indicated high prevalences of LF. This study investigated epidemiological aspects of LF in Dar es Salaam, as a background for planning and implementation of control.

Methods: Six sites with varying distance from the city center (3–30 km) and covering different population densities, socioeconomic characteristics, and water, sewerage and sanitary facilities were selected for the study. Pupils from one public primary school at each site were screened for circulating filarial antigen (CFA; marker of adult worm infection) and antibodies to Bm14 (marker of exposure to transmission). Community members were examined for CFA, microfilariae and chronic manifestations. Structured questionnaires were administered to pupils and heads of community households, and vector surveys were carried out in selected households.

Results: The study indicated that a tremendous decrease in the burden of LF infection had occurred, despite haphazard urbanisation. Contributing factors may be urban malaria control targeting *Anopheles* vectors, short survival time of the numerous *Culex quinquefasciatus* vectors in the urban environment, widespread use of bed nets and other mosquito proofing measures, and mass drug administration (MDA) in 2006 and 2007. Although the level of ongoing transmission was low, the burden of chronic LF disease was still high.

Conclusions: The development has so far been promising, but continued efforts are necessary to ensure elimination of LF as a public health problem. These will include improving the awareness of people about the role of mosquitoes in transmission of LF, more thorough implementation of environmental sanitation to reduce *Cx. quinquefasciatus* breeding, continued MDA to high-risk areas, and set-up of programmes for management of chronic LF disease.

Keywords: Lymphatic filariasis, Urban, Circulating filarial antigens, Bm14 antibodies, Microfilariae, Clinical manifestations, Vectors, Dar es Salaam, Tanzania

Background

The world has witnessed a tremendous increase in urbanization in recent decades. This is also the case for Sub-Saharan Africa, where the urban population has grown from 11.2% in 1950 to 36.3% in 2010 and is estimated to reach more than 50% by the year 2040 [1]. The growth is partly due to migration from rural to urban areas and partly to natural increase in the already existing urban population. Many of the rapid growing cities in developing countries are characterized by insufficient basic infrastructure, and the majority of rural migrants end up in informal and unplanned settlements where basic facilities are poor or absent. In 2010, 62% of the urban population in Sub-Saharan Africa was estimated to live in slums, which are urban areas where households lack access to safe water, adequate sanitation, sufficient living space, durable housing and security of tenure [2]. Such conditions provide favorable habitats for breeding of

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